

AMENDMENTS TO THE CLAIMS

1 (Currently amended). A wavelength selective optical switch comprising:
a polarization transformation device receiving input light having a plurality of wavelength components and outputting light of a predefined polarization;
a beam expanding device for expanding said light of predefined polarization in a predetermined plane;
a first dispersive element receiving said expanded light of predefined polarization, and dispersing wavelength components of said expanded light of predefined polarization in said predetermined plane;
a polarization conversion element receiving said dispersed wavelength components of said expanded light of predefined polarization, said polarization conversion element being pixelated generally along the direction of said dispersion such that separate pixels are associated with separate wavelength components of said expanded light, and at least one pixel of said polarization conversion element being operative to convert the polarization of light passing through said pixel according to a control signal applied to said pixel;
a second dispersive element receiving light from said polarization conversion element, and operative to combine said separate wavelength components of said light into multi-wavelength output light;
a beam compressing device aligned such that said multi-wavelength output light is compressed in said predetermined plane; and
a polarization selective device receiving said compressed multi-wavelength output light, ~~and said polarization selective device being aligned such that only those~~ components of said multi-wavelength output light having a predetermined polarization are transmitted therethrough.

2-4 (Canceled)

5 (Currently amended). A wavelength selective optical switch according to ~~any of claims 1 to 3~~ claim 1 and wherein said predefined polarization is a generally linear polarization.

6 (Currently amended). A wavelength selective optical switch according to ~~any of claims 1 to 5~~ claim 1 and further comprising at least one of a first focussing element

to focus said dispersed wavelength components of said expanded light of predefined polarization onto said polarization conversion element, and a second focussing element to collect said dispersed wavelength components of said light after passage through said polarization conversion element.

7 (Currently amended). A wavelength selective optical switch according to ~~any of claims 1 to 6~~ claim 1 and wherein said first dispersive element is operative to focus said dispersed wavelength components of said expanded light of predefined polarization onto said polarization conversion element, and said second dispersive element is operative to collect said dispersed wavelength components of said light after passage through said polarization conversion element.

8 (Canceled).

9 (Currently amended). A wavelength selective optical switch according to ~~any of claims 5 to 8~~ claim 2 and wherein said predetermined plane is generally parallel to the direction of said generally linear polarization of said light.

10 (Currently amended). A wavelength selective optical switch according to ~~any of claims 5 to 8~~ claim 2, and wherein; said predetermined plane is generally perpendicular to the direction of generally linear polarization of said light.

11 (Currently amended). A wavelength selective optical switch according to ~~any of claims 5 to 10~~ claim 2 and wherein said control signal applied to said pixel is such as to rotate the direction of ~~the~~ polarization of light passing through said pixel through essentially 90°.

12 (Currently amended). A wavelength selective optical switch according to ~~any of claims 5 to 10~~ claim 2 and wherein said polarization transformation device is a birefringent crystal having a half wave plate over part of its output.

13 (Currently amended). A wavelength selective optical switch according to ~~any of claims 5 to 10~~ claim 2 and wherein said polarization transformation device is such that said polarization direction of said at least one output beam of generally linearly polarized light is independent of the polarization of said input optical beam.

14 (Canceled).

15 (Currently amended). A wavelength selective optical switch according to ~~any of claims 12 to 14~~ claim 12 and ~~also~~ further comprising a linear polarizer at the output of

said birefringent crystal having a half wave plate over part of its output.

16 (Currently amended). A wavelength selective optical switch according to ~~any of the previous claims~~ claim 1 and wherein at least one of said beam expanding device and said beam compressing device is selected from a group consisting of a pair of anamorphic prism, a single prism and a cylindrical lens.

17-18 (Canceled)

19 (Currently amended). A wavelength selective optical switch according to ~~any of the previous claims~~ claim 1 and also further comprising at least one of a first linear polarizing - element disposed in the optical path before said polarization conversion element, and a second linear polarizing element disposed in the optical path after said polarization conversion element.

20 (Currently amended). A wavelength selective optical switch according to ~~any of the previous claims~~ claim 1 and wherein said polarization conversion element is a liquid crystal cell.

21(Currently amended). A wavelength selective switch module comprising a plurality of wavelength selective switches according to ~~any of the previous claims~~ claim 1, and wherein at least two of said wavelength dependent switches utilize a common one of at least one of a dispersive element, a focusing element and a polarization rotating element.

22 (Currently amended). A wavelength selective optical switch comprising:
a polarization transformation device receiving input light having a plurality of wavelength components and outputting light of a predefined polarization;

a beam expanding device for expanding said light of predefined polarization in a predetermined plane;

a dispersive element receiving said expanded light of predefined polarization, and dispersing wavelength components of said expanded light of predefined polarization in said predetermined plane;

a polarization conversion element receiving said dispersed wavelength components of said expanded light of predefined polarization, said polarization conversion element being pixelated generally along the direction of said dispersion such that separate pixels are associated with separate wavelength components of said

expanded light, and at least one pixel of said polarization conversion element being operative to convert the polarization of light passing through said pixel according to a control signal applied to said pixel; and

a reflective surface disposed in proximity to said polarization conversion element ~~and on the distal side of said polarization conversion element relative to that on which said light passing through said pixel is incident, such that said light~~ such that light is incident thereon after passing through said polarization conversion element, and is reflected back through said pixel of said polarization conversion element.

23 (Canceled).

24 (Original). A wavelength selective optical switch according to claim 22 and wherein said predefined polarization is a generally linear polarization.

25 (Original). A wavelength selective optical switch according to claim 24 and wherein said control signal applied to said pixel is such that the polarization of said light of said wavelength component is rotated through essentially 90° after returning through said pixel.

26 (Currently amended). A wavelength selective optical switch according to ~~any of claims 22 to 25~~ claim 22 and wherein said light returning through said pixel is directed back through said polarization transformation device for outputting from said switch.

27 (Currently amended). A wavelength selective optical switch according to ~~any of claims 22 to 26~~ claim 22 and wherein said input optical beam is obtained from an input fiber, and said light returning through said pixel for outputting from said switch is directed into an output fiber, and wherein said switch ~~also~~ further comprises a circulator to separate light in said output fiber from light in said input fiber.

28 (Original). A wavelength selective optical switch according to claim 24 and also comprising a linear polarizer having an extinction ratio disposed between said polarization conversion element and said reflective surface, said linear polarizer having its direction of polarization essentially parallel to that of said light of generally linear polarization, and wherein said control signal applied to said pixel is such as to rotate the direction of the polarization of light of said wavelength component passing through said pixel through essentially 90° such that said light of said wavelength component transmitted onwards through said linear polarizer is generally attenuated by said

extinction ratio.

29 (Original). A wavelength selective optical switch according to claim 28 and wherein light of said wavelength component reflected from said reflective surface is attenuated generally by said extinction ratio also in returning through said linear polarizer, such that the attenuation of said light of said wavelength component is generally proportional to the square of the extinction ratio of said linear polarizer.

30 (Currently amended). A wavelength selective optical switch comprising:
a dual fiber collimator inputting a fiber optical signal having a plurality of wavelength components, and outputting said signal as light having a plurality of wavelength components;

a first polarization transformation device receiving said light output from said dual fiber collimator, and outputting said light ~~[[of]]~~ with a predefined polarization;

a beam expanding device for expanding said light of predefined polarization in a predetermined plane;

a dispersive element receiving said expanded light of predefined polarization, and dispersing wavelength components of said expanded light of predefined polarization in said predetermined plane;

~~a polarization conversion element receiving~~ first reflecting surface directing said dispersed wavelength components of said expanded light of predefined polarization through a polarization conversion element, said polarization conversion element being pixelated generally along the direction of said dispersion such that separate pixels are associated with separate wavelength components of said expanded light, and at least one pixel of said polarization conversion element being operative to convert the polarization of light passing through said pixel according to a control signal applied to said pixel;

~~at least two a second reflective surfaces surface~~ disposed ~~relative to said polarization conversion element~~, such that said wavelength components of said light of generally linear polarization, after passage through said polarization conversion element, are directed back through said beam expansion device and said dispersive element, said dispersive element combining said separate wavelength components of said output light into multi-wavelength output light; and

a second polarization transformation device aligned such that that part of said

multi- wavelength output light having said predetermined polarization is transmitted therethrough and is output from said switch through said dual beam collimator.

31 (Canceled)

32 (Original). A wavelength selective optical switch according to claim 30 and wherein said predefined polarization is a generally linear polarization.

33 (Original). A wavelength selective optical switch according to claim 32 and wherein said control signal applied to said pixel is such as to rotate the direction of the polarization of light passing through said pixel through essentially 90°.

34 (Canceled).